

METHOD OF SYNTHESIZING NANORODS BY REACTION OF METAL-SURFACTANT COMPLEXES INJECTED USING A SYRINGE PUMP

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Abstract

Synthetic methods for producing uniform in diameter and highly crystalline nanorods of metals, alloys, metal oxides, metal nitrides, metal pnictides or metal chalcogenides by reaction of metal-surfactant complexes injected at a constant injection rate using a syringe pump into a surfactant solution in order to induce the one-dimensional growth of the nanostructured materials, where the reaction includes thermal decomposition, reduction, oxidation, sulfidation and phosphidation, are disclosed. The steps of a typical synthetic method consist of forming metal-surfactant complexes from the reaction of metal precursors and surfactant, injecting said metal-surfactant complex into a solution containing a surfactant and a reagent at high temperature using a syringe pump at a constant injection rate, aging at high temperature, and separating as well as precipitating by adding a poor solvent, and finally retrieving the desired nanorods by centrifuging.